2) Since the p-value is 0.11, we would fail to reject Ho, and conclude that $\mu_{meat} = \mu_{beef}$. So if we created an interval, 0 would be in the interval because 0 = no difference between the two averages.

3) (a) since the endpoints are negative this indicates that $\mu_{meat} - \mu_{beef}$ = negative #'s. This tells us that $\mu_{meat} < \mu_{beef}$.

(b) Since 0 is not in the interval, this indicates to us that there is a difference between the average fat content for meat and beef hot dogs.

(c) Conf = 90% α = 10% (0.10)

11) $\overline{x}_A = 40$ $\overline{x}_B = 43$

$s_A = 3$ $s_B = 2$

$n_A = 20$ $n_B = 20$

(a) Conditions:

- 2 independent SRS — stated random and indep.
- $pop_1 \geq 10n_1$, $pop_2 \geq 10n_2$ — there are more than 200 trips taken to work each route
- 2 normal populations or n_1 and $n_2 \geq 30$ — stated that both sets of data are roughly symmetric with no outliers --> normal pop.

Conditions met --> use Student's t-distribution --> 2-sample t-Interval

$$(\bar{x}_1 - \bar{x}_2) \pm (t^*)\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} = (-4.64, -1.36)$$

df = 33.103

We are 95% confident that the difference between the average time to work with Route A and B is between -4.64 and -1.36 minutes.

Because the values are negative, Route A is faster (less time) than Route B.

(b) No, he should not believe the 5 min. claim because 5 min is not in the interval.

14)

(a) Conditions:

- 2 independent SRS	- assumed random and indep.
- $pop_1 \geq 10n_1$ $pop_2 \geq 10n_2$	- there are more than 300 male Egyptians from 3000 BC and more than 300 from 200 BC
- 2 normal populations or n_1 and $n_2 \geq 30$	- normal prob. plot of both data sets are linear with no outliers --> normal pop.

Conditions met --> use Student's t-distribution --> 2-sample t-test

b) $$(\bar{x}_1 - \bar{x}_2) \pm (t^*)\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} = (-6.655, -1.878)$$

We are 95% confident that the difference between the average skull breadth of 4000 BC and 200 BC is between -6.655 and -1.878 mm.

(c) Since 0 is not in our interval, we have evidence that the average skull breadth is different between 4000 BC and 200 BC. Since the numbers are negative, we have evidence that the skull breadth is greater in 200 BC.

27) Ho: $\mu_1 = \mu_2$

Ha: $\mu_1 \neq \mu_2$

#1 = small

#2 = large

Conditions met --> Student's t-distribution --> 2 sample t test

$$t = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = -2.104$$

2*P(t < -2.104 | df = 34.313) = 0.0428

We reject Ho b/c p-value of 0.0428 < α = 0.05. We have sufficient evidence that the average amount of ice cream in the large bowl is not equal to the average amount in the small bowl.

36) (a) Ho: $\mu_M = \mu_R$

Ha: $\mu_M > \mu_R$

#1 = mozart

#2 = rap

Conditions met --> Student's t-distribution --> 2 sample t test

$$t = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = -0.70006$$

$P(t > -0.70006 \mid df = 45.8776) = 0.7563$

We fail to reject Ho b/c p-value of $0.7563 > \alpha = 0.05$. We have sufficient evidence that listening to Mozart and rap music produce similar results with memorization.

(b) conditions met --> student's t-distribution -->
2 sample t Interval

#1: Mozart
#2: none

$$(\bar{x}_1 - \bar{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} = (-5.351, -0.1886)$$

df=

We are 90% confident that the difference between the average # of objects memorized while listening to Mozart music vs. no music is between -5.351 and -0.1886 objects.

We have sufficient evidence that the # of objects memorized with Mozart is less than with no music. ($\mu_M - \mu_N$ = negative)